Data Visualization with Tableau
Aysegul Dahi

A. Data Preparation

1. Checking for Missing Values

Loaded the dataset using Pandas and displayed an overview using df.info().Used df.isnull().sum() to identify missing values in all columns. Found missing values in the "Product Base Margin" column.

```
[3]: missing_values = df.isnull().sum()
     missing_values[missing_values > 0]

[3]: Product Base Margin    72
     dtype: int64

[4]: df['Product Base Margin'] = df['Product Base Margin'].fillna(df['Product Base Margin'].median())

[5]: df.isnull().sum()
```

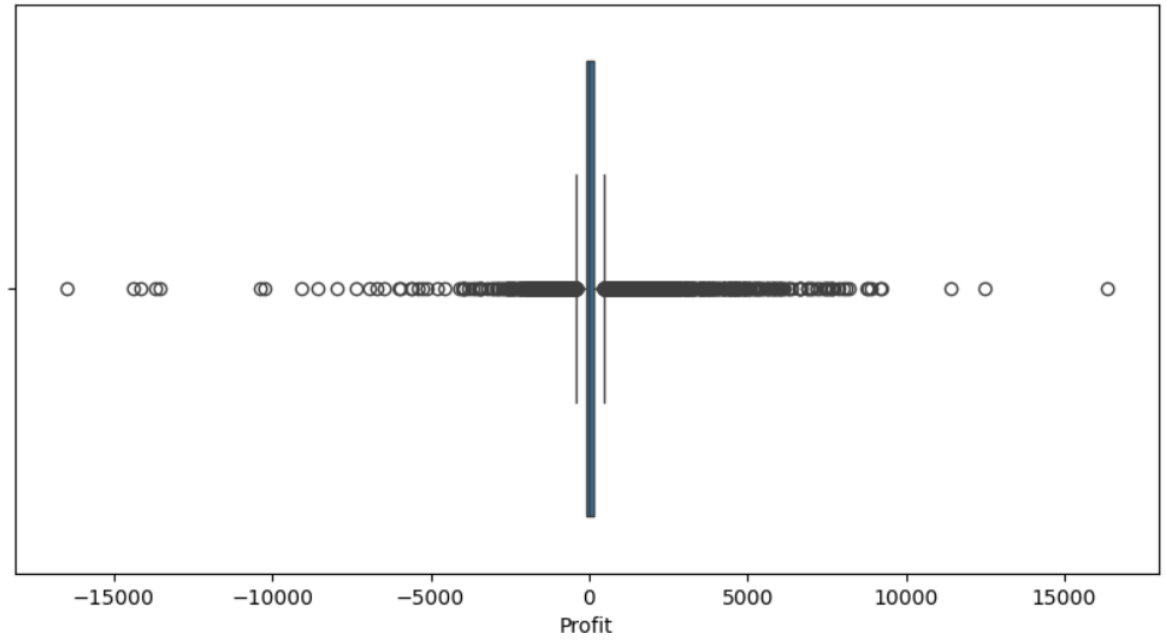
Handling Missing Values

Filled missing values in "Product Base Margin" using the median value. Verified that there were no remaining missing values using df.isnull().sum().

Detecting and Removing Outliers

Used a Box Plot (seaborn.boxplot) to visualize outliers in the "Profit" column. Applied the Interquartile Range (IQR) method to detect and remove extreme outliers. Confirmed that extreme outliers were removed.

```
plt.figure(figsize=(10,5))
sns.boxplot(x=df['Profit'])
plt.show()
```



Final Data Verification

Checked summary statistics before and after outlier removal using. Confirmed that data is now clean and ready for Tableau visualization.

[7]:
```
# Calculate Q1 (25th percentile) and Q3 (75th percentile)
Q1 = df['Profit'].quantile(0.25)
Q3 = df['Profit'].quantile(0.75)

# Compute the IQR (Interquartile Range)
IQR = Q3 - Q1

# Define the lower and upper bound
lower_bound = Q1 - 1.5 * IQR
upper_bound = Q3 + 1.5 * IQR

# Filter out the outliers
df_no_outliers = df[(df['Profit'] >= lower_bound) & (df['Profit'] <= upper_bound)]

# Show how many outliers were removed
print(f"Original Dataset Size: {len(df)}")
print(f"New Dataset Size: {len(df_no_outliers)}")
print(f"Outliers Removed: {len(df) - len(df_no_outliers)}")
```

```
Original Dataset Size: 9426
New Dataset Size: 7532
Outliers Removed: 1894
```

```
Before Outlier Removal:
count     9426.000000
mean       139.236410
std        998.486483
min     -16476.838000
25%        -74.017375
50%          2.567600
75%        140.243850
max      16332.414000
Name: Profit, dtype: float64

After Outlier Removal:
count    7532.000000
mean        6.966990
std       146.230713
min      -394.403520
25%       -62.850500
50%        -2.776970
75%        53.937875
max       461.334000
Name: Profit, dtype: float64
```

Phase 1: Data Exploration & Problem Definition

Initial Data Exploration

Before performing any advanced analysis, conducted an exploratory review of the datasets in Tableau to understand distributions, key variables, and relationships:

A. Loading the Data

Imported the cleaned datasets into Tableau. Verified that all columns were correctly categorized (numerical, categorical, and geographical fields).

B. Basic Visualizations & Summary Statistics

To gain an initial understanding of the data, created:

1. **Bar Chart –** Average Sales by Product Category: The Technology and Furniture categories have the highest average sales. Office Supplies have significantly lower average sales compared to other categories.
2. **Scatter Plot – Profit vs. Discount:** Most data points are clustered near low discount values, indicating discounts may not always correlate with higher profits. Some categories (e.g., Technology) show outliers, meaning high discounts can sometimes lead to high or low profits.

3. **Geographical Map –** Sales & Profit by Region: Certain regions (e.g., Texas, California) have higher sales (larger circles). Profitability varies (some regions show orange/red circles, meaning losses) .
4. **Summary Statistics:** Checked total sales, average profit, and discount trends.

Defined Analytical Questions

Based on data exploration, formulated the following key business questions:

1. Sales & Profitability Analysis

Question: Does a higher discount necessarily lead to higher sales? Identify any products or categories where this trend doesn't hold.

Why this question?: Helps evaluate pricing strategies and their impact on profitability. Determines whether higher discounts effectively drive sales or if they lead to losses.

2. Regional & Customer Analysis

Question: Which regions demonstrate a significant impact of shipping costs on profit margins? What strategies could optimize these costs?

Why this question? Identifies regions where high shipping costs reduce profit margins. Helps in optimizing supply chain strategies for cost efficiency.

4. Observations & Insights

During the initial data exploration in Tableau:

-Certain product categories showed negative profits despite high sales.

-Some regions experienced high shipping costs, reducing profitability.

-Discounts did not always increase sales, indicating potential inefficiencies in discount policies.

-Identified which regions have high sales but low profits.

-Noted that high shipping costs may impact profits in certain areas.

Data Structure: Applying Joins in Tableau

To merge the two datasets, used a **RIGHT JOIN**, following these steps:

1. Dragged “Geographic & Census Data” first into Tableau's Data Source Tab.
2. Then dragged Superstore Sales Data and applied a RIGHT JOIN.
3. **Join Condition:** Geographic_Census_Data.Geographic Area = Superstore_Sales_Data.State or Province

Justification for Using RIGHT JOIN Instead of Relationships

- A RIGHT JOIN was used to ensure that all Superstore Sales Data remained while adding Census data.
- If a state was missing from Census data, the Superstore Sales Data would still be preserved.
- Relationships were not used because they do not merge data into a single table, which was necessary for aggregated analysis.
- Using a JOIN instead of Data Blending ensured better performance and consistency in calculations.

3. Field Creation & Categorization

To answer research questions, created the following calculated fields, hierarchies, groups, and sets.

A. Necessary Calculated Fields

1. Profit Margin (for profitability analysis)

[Profit] / [Sales]

Used to measure profitability across products and regions.

2. Order Duration (to track order efficiency)

DATEDIFF('day', DATE([Order Date]), DATE([Ship Date]))

Helps analyze shipping delays and customer satisfaction.

3. Shipping Cost Impact Score (to assess regional costs)

[Shipping Cost] / [Sales]

Used to identify areas where high shipping costs reduce profit margins.

B. Level of Detail (LOD) Calculations & Justifications

1. State-Level Profit Margin (Fixed LOD Calculation)

{ FIXED [State] : SUM([Profit]) / SUM([Sales]) }

Ensures profitability is calculated at the State level regardless of filters.

2. Average Discount by Product Category (Fixed LOD Calculation)

{ FIXED [Product Category] : AVG([Discount]) }

Allows comparison of discounts across different product categories without being affected by visualization filters.

3. Total Sales per Region (Fixed LOD Calculation)

{ FIXED [Region] : SUM([Sales]) }

Helps compare regional sales performance, even when product-level filters are applied.

4. Discount Percentile Classification (Fixed LOD Calculation)

IF [Discount] > {FIXED : PERCENTILE([Discount], 0.20)} THEN "High Discount" ELSE "Low Discount" END

Segments products into "High Discount" and "Low Discount" based on the 20th percentile of discount values, ensuring consistent discount categorization across different visualizations.

5. State Profitability Classification (Fixed LOD Calculation)

IF { FIXED [State] : SUM([Profit]) / SUM([Sales]) } < 0 THEN "High-Risk State" ELSE "Low-Risk State" END

Dynamically classifies states as "High-Risk" (negative profit margin) or "Low-Risk" to better analyze unprofitable regions. This method ensures consistency and avoids manual group creation.

C. Hierarchies, Groups & Sets

1. Geographic Hierarchy → Allows drill-down analysis:

Region → State → City (Helps analyze trends at different levels.)

D. Filter Types & Justifications

To ensure only relevant data is used, applied different filters.

1. Context Filter → Filtered by Region first, then by State. Helps prioritize filters in drill-down analysis.

2. Measure Filter → Filtered for Products with Sales > $500

Ensures focus on mid-to-high value transactions for better insights.

3. Dimension Filter → Filtered out specific product categories for focused analysis. Allows targeted investigation into sales and profitability trends.

Phase 3: Core Analysis & Visualization

Breaking Down the Problem into Sub-Questions

To analyze sales profitability and regional shipping cost impact, divide the problem into smaller sub-questions:

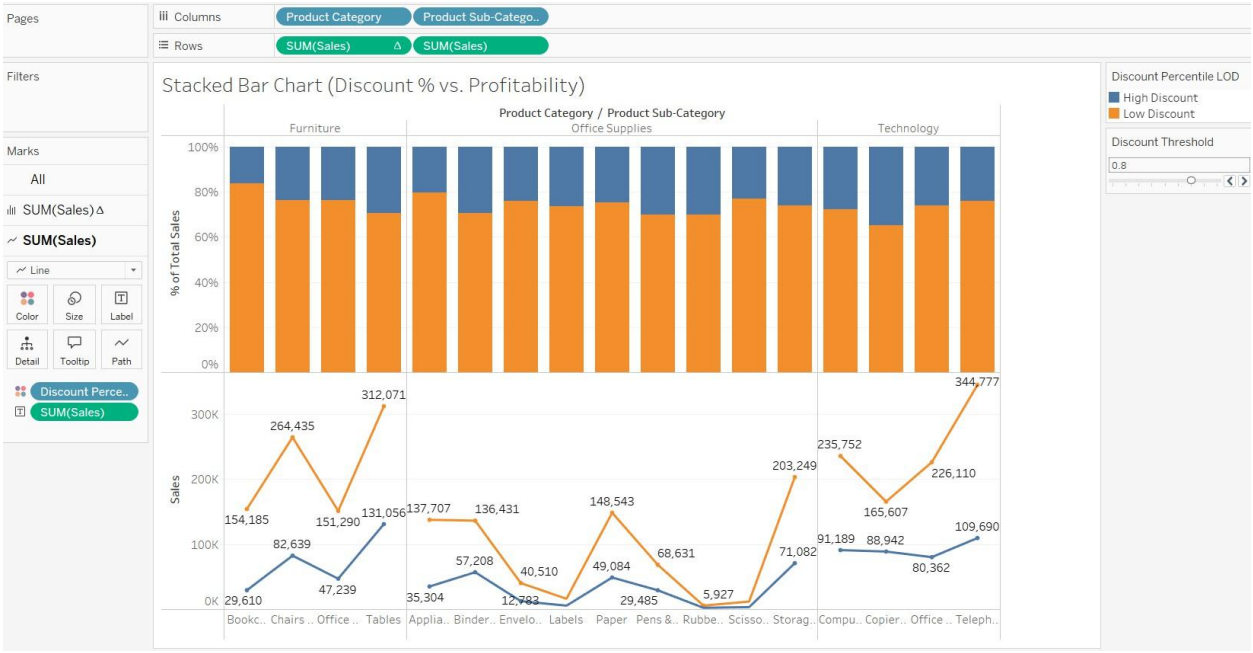
1. **Sales & Profitability Trends**
    - Does a higher discount necessarily lead to higher sales?
    - Are there specific product categories where discounts do not increase sales?
    - What are the long-term trends in sales and discounting strategies?
    - Which sub-categories follow the Pareto Principle (80/20 Rule)?
    - Are there sub-categories where sales and profit trends differ significantly?

2. **Regional & Customer Analysis**
    - Which regions have high shipping costs impacting profit margins?
    - Are certain states consistently low-profit due to logistics expenses?
    - How does shipping mode affect cost and profitability?

CHARTS

1. **Stacked Bar Chart (Discount % vs. Profitability with Total Sales Trend)**

   This visualization compares how much of each category's sales come from High vs. Low Discounts and shows the impact of discounting strategies on total sales. The chart answer this question: Does a Higher Discount Necessarily Lead to Higher Sales?



Technology Has the Highest Proportion of High Discounts and the Highest Sales : 27.58% of Technology sales come from High Discounts, the highest among all categories. Technology also has the highest total sales (972,246), suggesting that discounts drive sales growth in this category. Since High Discounts are a larger percentage of total sales, it implies that Technology sales might be discount-sensitive.

Furniture and Office Supplies Have a Lower Share of High Discounts: Furniture (24.78%) and Office Supplies (25.76%) have a smaller percentage of sales from High Discounts. Yet, their total sales remain strong, meaning discounts might not be the primary driver of sales in these categories.

Low Discount Sales Dominate Across All Categories: More than 70% of total sales in each category come from Low Discounts. This suggests that offering High Discounts is not the only factor that boosts sales.

Total Sales Increase as High Discount Proportion Increases, But Not Always: For Technology, higher discounts seem to align with higher total sales. However, for Furniture and Office Supplies, total sales remain strong even with fewer High Discounts. This suggests that discounting might be effective for some product types (like Technology) but not necessarily for others.

Parameter Used for Dynamic Discount Classification

A dynamic parameter (Discount Threshold) allows users to adjust what qualifies as a "High Discount."

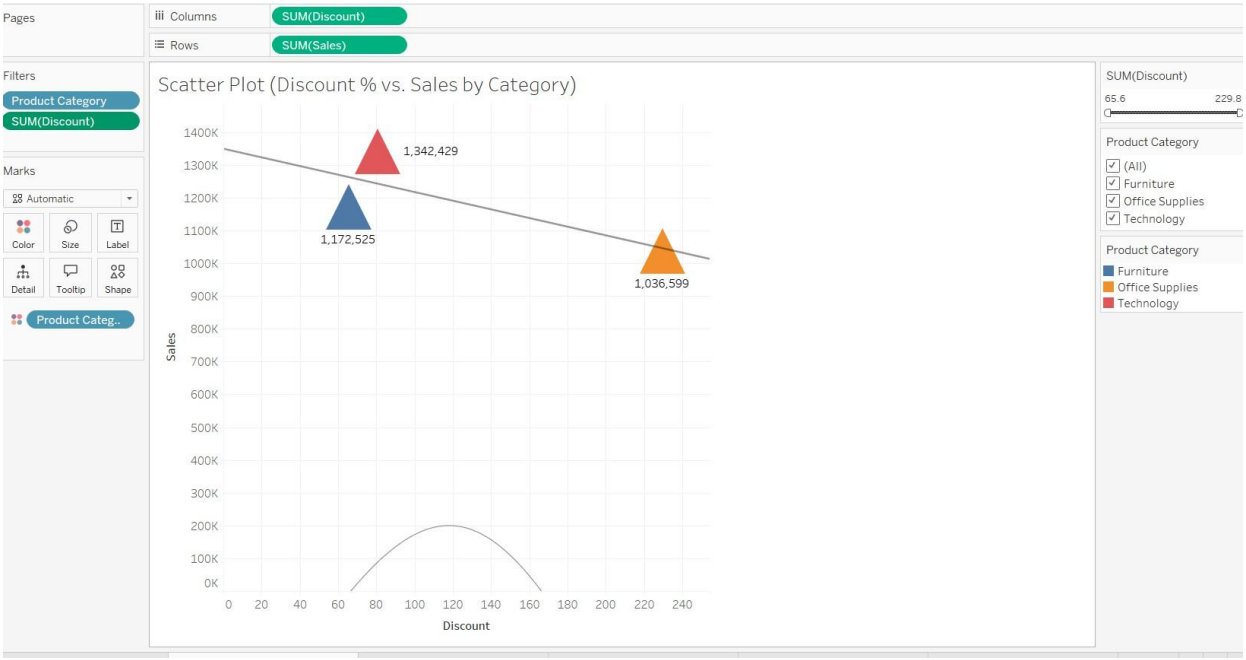
Formula Used: IF [Discount] >= {FIXED : PERCENTILE([Discount], [Discount Threshold])} THEN "High Discount" ELSE "Low Discount" END

Parameter Details: Data Type: Float **Range:** 50th to 90th percentile **Default Value:** 80th percentile.

Purpose of Parameter: Allows users to define "High Discount" dynamically, adjusting the threshold from 50% to 90%. Helps analyze how different discount levels impact sales across categories. Enables decision-makers to fine-tune pricing strategies based on category-specific discount behavior.

2. Scatter Plot (Discount % vs. Sales by Category) with Filters

This Scatter Plot directly visualizes the relationship between Discount % and Total Sales for each Product Category, helping to answer: "Are There Specific Product Categories Where Discounts Do Not Increase Sales?"



Negative Correlation Between Discount % and Sales: The trend line is sloping downward, indicating that higher discounts are associated with lower total sales. This suggests that increasing discounts does not necessarily drive higher sales overall.

Office Supplies (Orange) Has the Highest Discount but the Lowest Sales: Despite having the highest discount levels (~240%), Office Supplies has the lowest total sales (~1.03M). This strongly suggests that discounting in this category is ineffective in driving higher revenue.

Technology (Red) Has the Highest Sales with Moderate Discounts: Technology shows the highest total sales (~1.34M) but does not have the highest discount levels. This suggests that other factors, such as product demand, may drive sales more than discounts.

Furniture (Blue) Shows a Moderate Discount and Strong Sales: Furniture has a discount of ~80% and total sales of ~1.17M. It does not show a strong dependency on discounting for generating revenue.

Product Category Filter Enables Focused Analysis: Users can select individual categories to analyze whether discounts influence sales differently. If selecting only "Office Supplies", we can isolate its trend and see that high discounts do not lead to strong sales.If selecting "Technology", we can see that moderate discounts lead to the highest total sales.

Discount Range Filter Highlights the Effectiveness of Different Discount Levels: Lowering the discount range (e.g., 50% - 150%) can help isolate sales data for moderate discounts. Expanding the range (e.g., 50% - 250%) allows users to analyze if extreme discounts impact sales positively or negatively. If the trend remains downward as discounts increase, it confirms that higher discounts do not necessarily increase sales.

3. Trend Line (Discount & Sales Over Time) with Dynamic Sub-Category Selection

This Trend Line (Discount & Sales Over Time) helps answer the question: What Are the Long-Term Trends in Sales and Discounting Strategies? This trend line shows how sales and discount strategies have evolved over time, allowing to identify long-term patterns.

Sub-Categories Respond Differently to Discounts: Some sub-categories see higher sales with higher discounts, while others remain stable. Scissors & Rulers show a fluctuating discount pattern, while sales remain consistent.

Sales & Discounting Trends Are More Readable with the Moving Average: The Moving Average for Sales smooths out fluctuations, making long-term trends clearer. Discount levels now appear in a distinct color, making it easier to compare trends.

Interactive Parameter Enables Deep-Dive Analysis by Product Sub-Category: Users can dynamically select sub-categories and observe whether discounts impact sales over time. This helps identify which sub-categories are most sensitive to discounting strategies.

Parameters & Calculated Fields Used

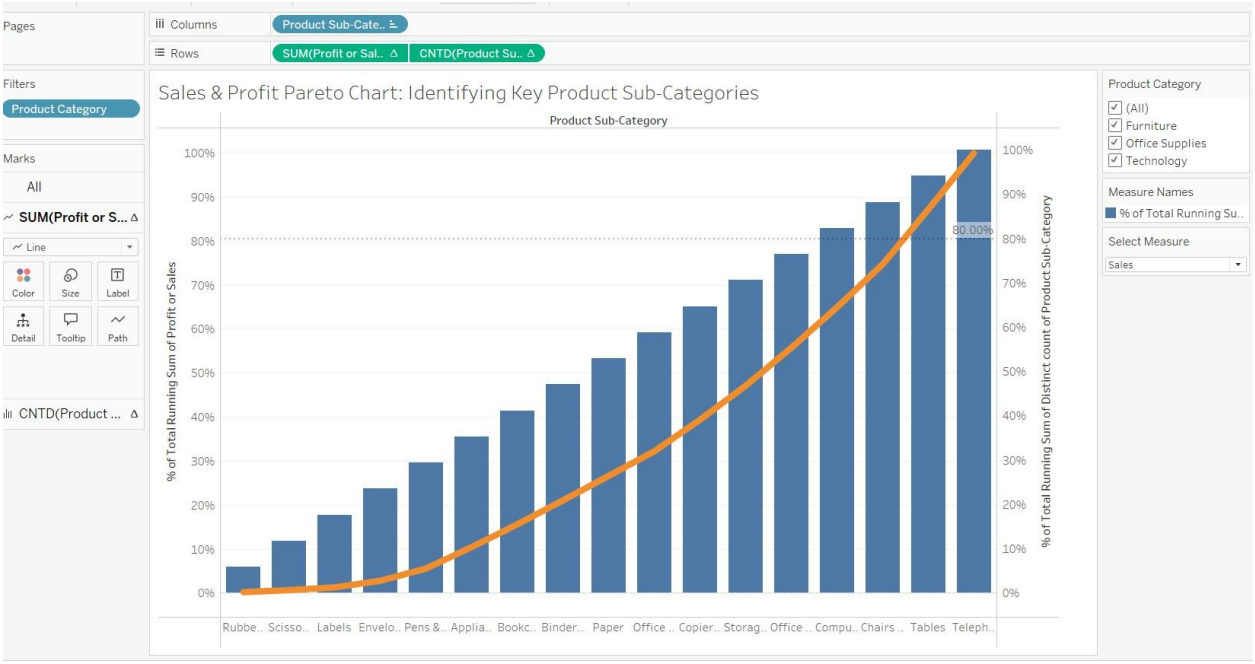
Parameter: Dynamic Sub-Category Selection : Allows users to select a specific product sub-category for focused analysis.
Setup: Data Type: String **Allowable Values:** List (Loaded from Product Sub-Category),

Calculated Field
Sub-Category Filter: Ensures only the selected **Product Sub-Category** appears in the visualization.
Formula: IF [Product Sub-Category] = [Select Product Sub-Category] THEN "Show" ELSE "Hide"
Applied as a Filter: Only **"Show"** values are displayed.

4. **"Sales & Profit Pareto Chart: Identifying Key Product Sub-Categories"**

This Pareto Chart is designed to analyze the contribution of different Product Sub-Categories to overall sales and profitability. The chart answers these questions:

- Which product sub-categories contribute the most to total sales/profit?
- Which sub-categories follow the Pareto Principle (80/20 Rule)?
- Are there sub-categories where sales and profit trends differ significantly?



Pareto Curve Interpretation: The bars represent the cumulative contribution of each product sub-category to total sales or profit. The orange line represents the Pareto principle (80/20 rule), showing how quickly cumulative sales/profit reach 80% of the total. The right Y-axis helps track the cumulative percentage of the selected measure.

Sorted in Ascending Order: The sub-categories are sorted from lowest to highest contribution. This helps quickly identify which sub-categories contribute the least to total sales/profit.

Parameter Control for Interactive Analysis: Users can switch between "Sales" and "Profit" using the parameter dropdown.Allows analysis of low-sales but high-profit products or high-sales but low-profit products.

Key Insights from the Pareto Analysis

Most Sales Come from Technology & Furniture: Technology-related sub-categories contribute the highest to total sales. Tables & Chairs also contribute significantly, aligning with expectations for high-volume office furniture sales.

Some Sub-Categories Follow the Pareto Principle: 80% of total sales come from a few top-selling categories, confirming the Pareto principle. A few sub-categories account for nearly all profits, while many contribute little.

Identifying Underperforming Sub-Categories: If Profit is selected instead of Sales, the chart may reveal high-sales but low-profit sub-categories. Some sub-categories may generate revenue but barely contribute to profits.

Filters & Parameters Used in This Chart

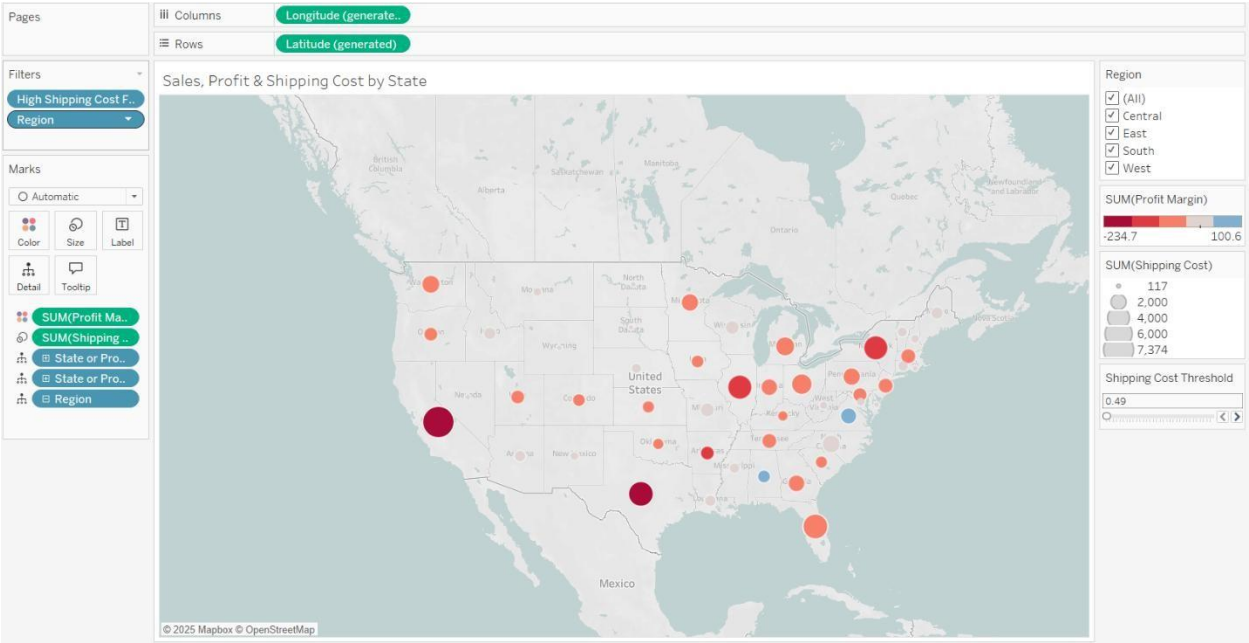
Parameter: "Select Measure" allows switching between Sales, Profit, and Absolute Profit.

The calculated field "Profit or Sales" dynamically updates based on the selected measure:

Formula: IF [Select Measure] = "Sales" THEN [Sales] ELSEIF [Select Measure] = "Profit" THEN [Profit] ELSE ABS([Profit]) END

This flexibility enables a **comparative analysis** of sales vs. profit trends.

5. Map (Sales, Profit & Shipping Cost by State)



This Map (Sales, Profit & Shipping Cost by State) helps answer the question: Which Regions Have High Shipping Costs Impacting Profit Margins? The geographic visualization allows to analyze regional variations in sales, profit margins, and the impact of shipping costs.

Regions with High Shipping Costs Often Have Low Profit Margins: Texas, California, and parts of the Midwest show high shipping costs (large circles) and low profitability (deep red color). This indicates that logistics costs may be eating into profits.

Some High-Cost States Still Maintain Profitability: Certain states show large shipping costs but remain in the blue (profitable). This suggests that some regions have better cost absorption strategies or higher revenue to offset shipping expenses.

Users Can Dynamically Explore High-Cost Regions: The Shipping Cost Threshold parameter allows users to adjust which regions appear based on cost levels. This makes it easy to identify states that cross a critical cost threshold where profitability is impacted.

Parameters & Calculated Fields Used

Shipping Cost Threshold Parameter: Allows users to filter states where shipping costs exceed a certain level.

Setup: Data Type: Float **Range:** Min to Max Shipping Costs in Dataset **Step Size:** 5.

Calculated Field

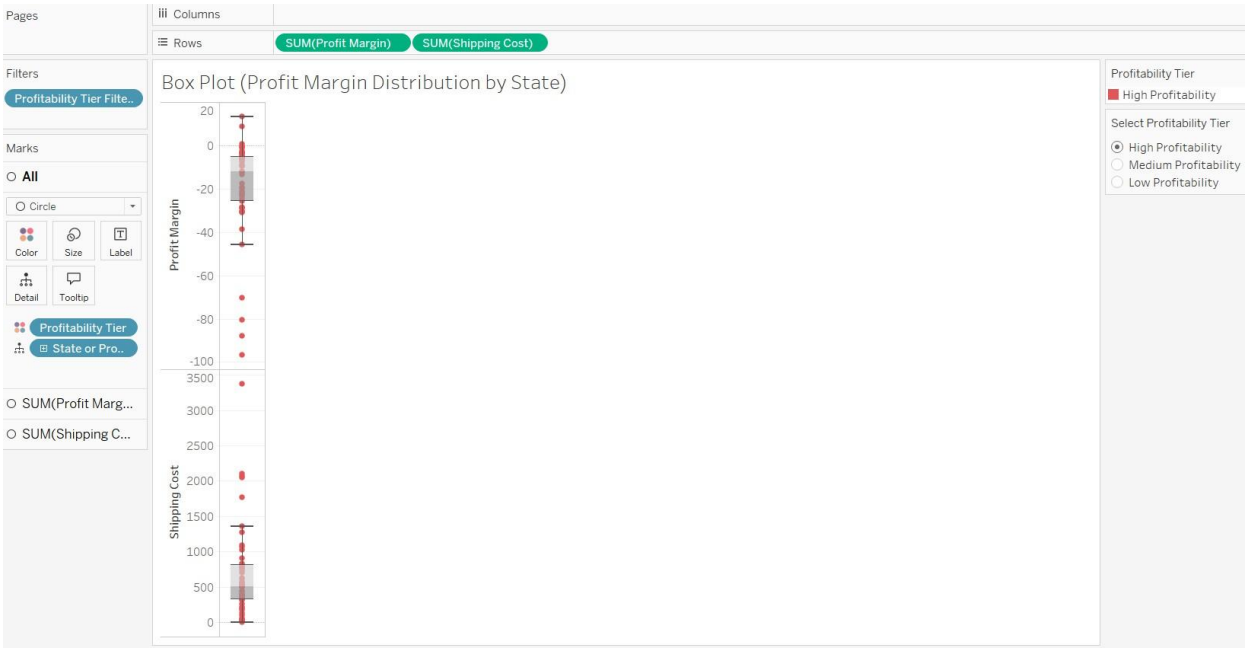
High Shipping Cost Filter: Filters out states where shipping costs are too low, focusing only on **high-cost regions affecting profitability**.

Formula: IF [Shipping Cost] >= [Shipping Cost Threshold] THEN "Show" ELSE "Hide" END

Applied as a Filter: Only **"Show"** values are displayed.

6. Box Plot (Profit Margin Distribution by State)

This Box Plot (Profit Margin Distribution by State) helps answer the question: Are Certain States Consistently Low-Profit Due to Logistics Expenses? It is showing the distribution of Product Base Margin and Shipping Costs across states.



Profit Margin Distribution: The box plot for Product Base Margin shows states categorized into:

Red: High Profitability: Top **25% percentile** of profit margins.

Blue: Low Profitability: Bottom **25% percentile** of profit margins.

Brown: Medium Profitability: The middle **50% percentile** (between 25th and 75th percentiles).

Users Can Focus on Specific Profitability Tiers : The parameter dynamically updates the box plot, allowing users to analyze only High, Medium, or Low-profit states. This helps isolate problem areas related to logistics expenses.

Low-Profit States Often Have High Shipping Costs: When selecting Low Profitability, the box plot shows that shipping costs are often high, suggesting logistics expenses might be reducing profits.

Profitability & Shipping Costs Show Variation Across States: High-profit states tend to have more stable shipping costs, whereas low-profit states show greater variability in both shipping costs and profit margins.

The parameter allows users to isolate Low-Profit states, making it clear which states suffer from high shipping costs.

Parameters & Calculated Fields Used

Profitability Tier: The Profitability Tier field is used as a filter, meaning only selected profitability groups are displayed. If a specific tier is chosen (e.g., Low Profitability), we can focus only on those states that consistently struggle with profitability.

Profitability Tier Calculation (Filter Applied)

The **Profitability Tier field** classifies states based on **fixed percentiles**:

Formula: IF [Product Base Margin] > {FIXED : PERCENTILE([Product Base Margin], 0.75)}

THEN "High Profitability" ELSEIF [Product Base Margin] > {FIXED : PERCENTILE([Product Base Margin], 0.25)} THEN "Medium Profitability" ELSE "Low Profitability" END

Why this Filter? Helps segment states into different profitability levels. Allows focused analysis on high-risk states. Enables targeted strategies for improving profitability in underperforming states.

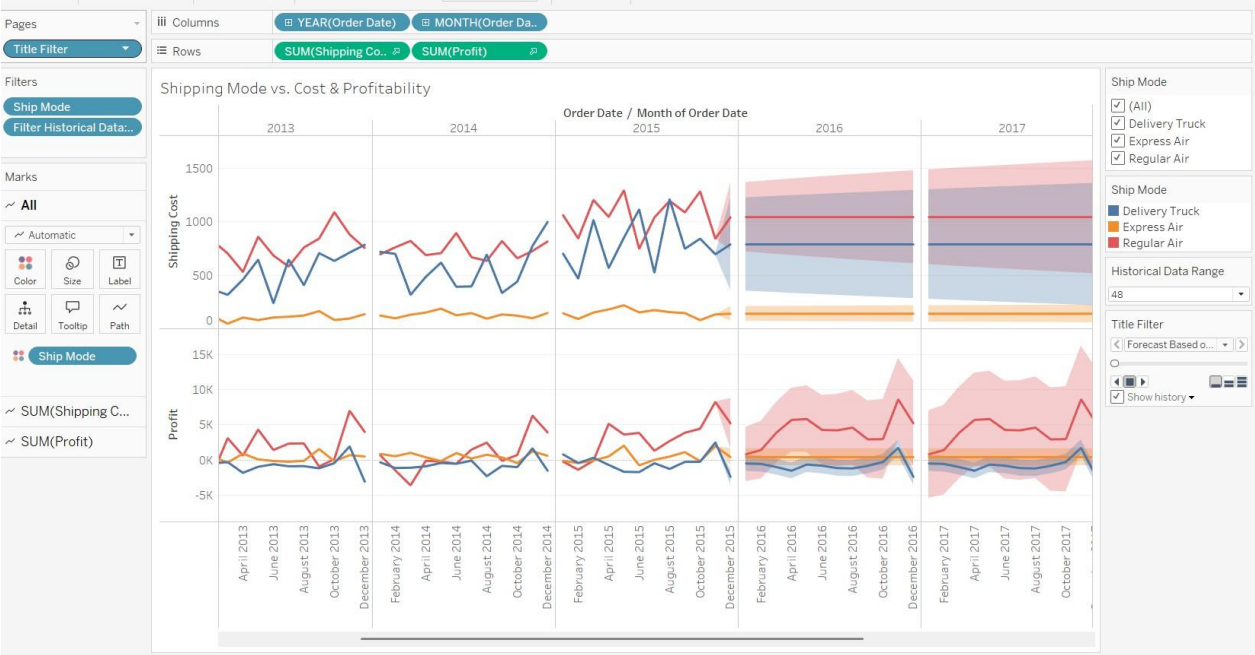
Parameter: Select Profitability Tier: Allows users to filter the box plot based on High, Medium, or Low-profit states.
Setup: Data Type: String **Allowable Values:** List : "High Profitability", "Medium Profitability" "Low Profitability".

7. Line Chart with Forecasting (Shipping Mode vs. Cost & Profitability)

This time-series visualization showcases how shipping costs and profitability evolve over time for different shipping modes. It answers this question: How Does Shipping Mode Affect Cost and Profitability? The Historical Data Range Parameter dynamically filters the historical range used to generate the forecast. This ensures that the forecast is based on a selected timeframe of past data.

Shipping Costs Continue to Rise: Regular Air (Red) and Delivery Truck (Blue) show significant increases in shipping costs over time. Express Air (Orange) remains the most stable, suggesting less cost fluctuation compared to other shipping modes. The shaded forecast area indicates continued cost growth, with the strongest increase predicted for Regular Air.

Profitability Trends Vary Across Shipping Modes: Regular Air shows the highest cost spikes, but its profitability also fluctuates significantly. Delivery Truck has moderate profit fluctuations, but costs remain a major factor affecting its profitability. Express Air remains the most stable, but with lower profitability than other modes.



Profitability Trends Vary Across Shipping Modes: Regular Air shows the highest cost spikes, but its profitability also fluctuates significantly. Delivery Truck has moderate profit fluctuations, but costs remain a major factor affecting its profitability. Express Air remains the most stable, but with lower profitability than other modes.

Forecasting Predicts Increased Shipping Costs & Profit Variability: The forecast model (shaded regions) suggests that shipping costs will continue to increase. Profitability forecasts remain volatile, indicating that increased shipping costs are not necessarily translating into higher profits.

Filters & Parameters Used in This Chart

Historical Data Range Parameter: The historical range that was utilized to create the forecast is dynamically filtered. This guarantees that the forecast is predicated on a chosen period of historical data. Users can select different historical timeframes (e.g., 24, 36, or 48 months) to see how different data ranges impact the forecast results. The forecast model then updates dynamically based on the amount of past data available, ensuring more control over trend analysis.

Filter Historical Data: Filters the dataset to include only the last 12, 24, 36 or 48 months of historical data for generating the forecast.

Formula: [Order Date] >= DATEADD('month', -[Forecast Length], {FIXED : MAX([Order Date])})

Title Filter: Updates the chart title based on the selected historical data range, making the forecast period explicit.
Formula: "Forecast Based on Last " + STR([Historical Data Range]) + " Months of Data"

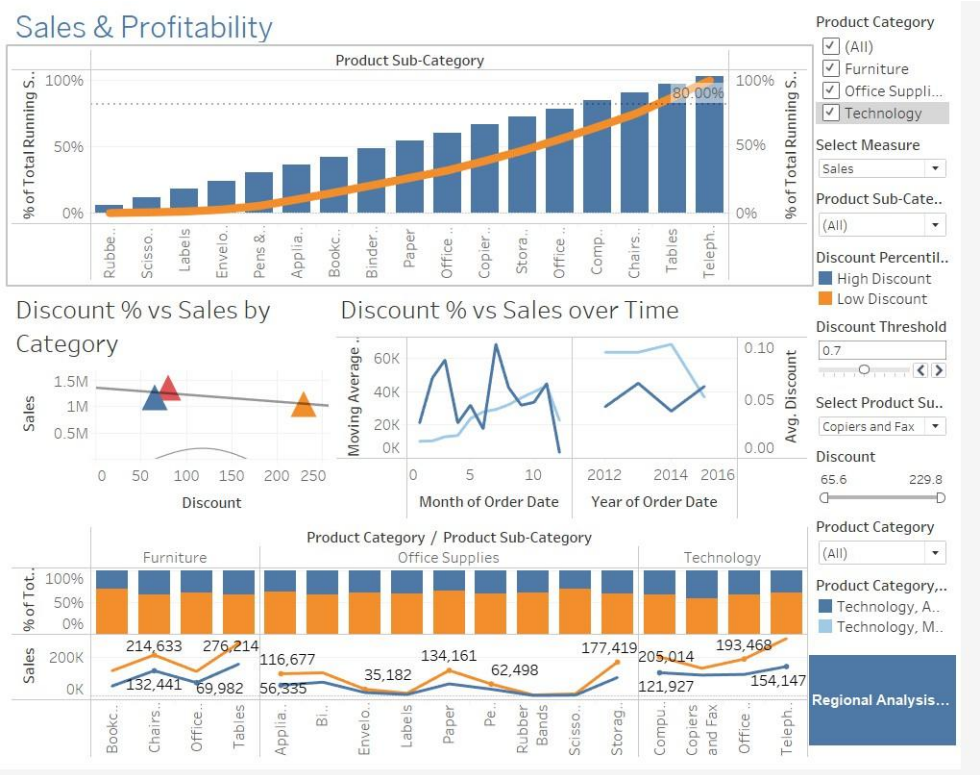
PHASE 4: DASHBOARD DESIGN

1. Sales & Profitability Dashboard

Goal: This dashboard aims to analyze how discounts affect sales and profitability, highlighting product categories that benefit the most from discounting strategies.

Key Visualizations:

Pareto Chart: Identifies key product sub-categories contributing to overall sales or profitability.
Scatter Plot: Shows the relationship between discount percentage and sales by category.
Trend Line: Displays sales and discount percentage trends over time.
Stacked Bar Chart: Compares high vs. low discounts within each category, revealing their impact on total sales.



Actions Used:

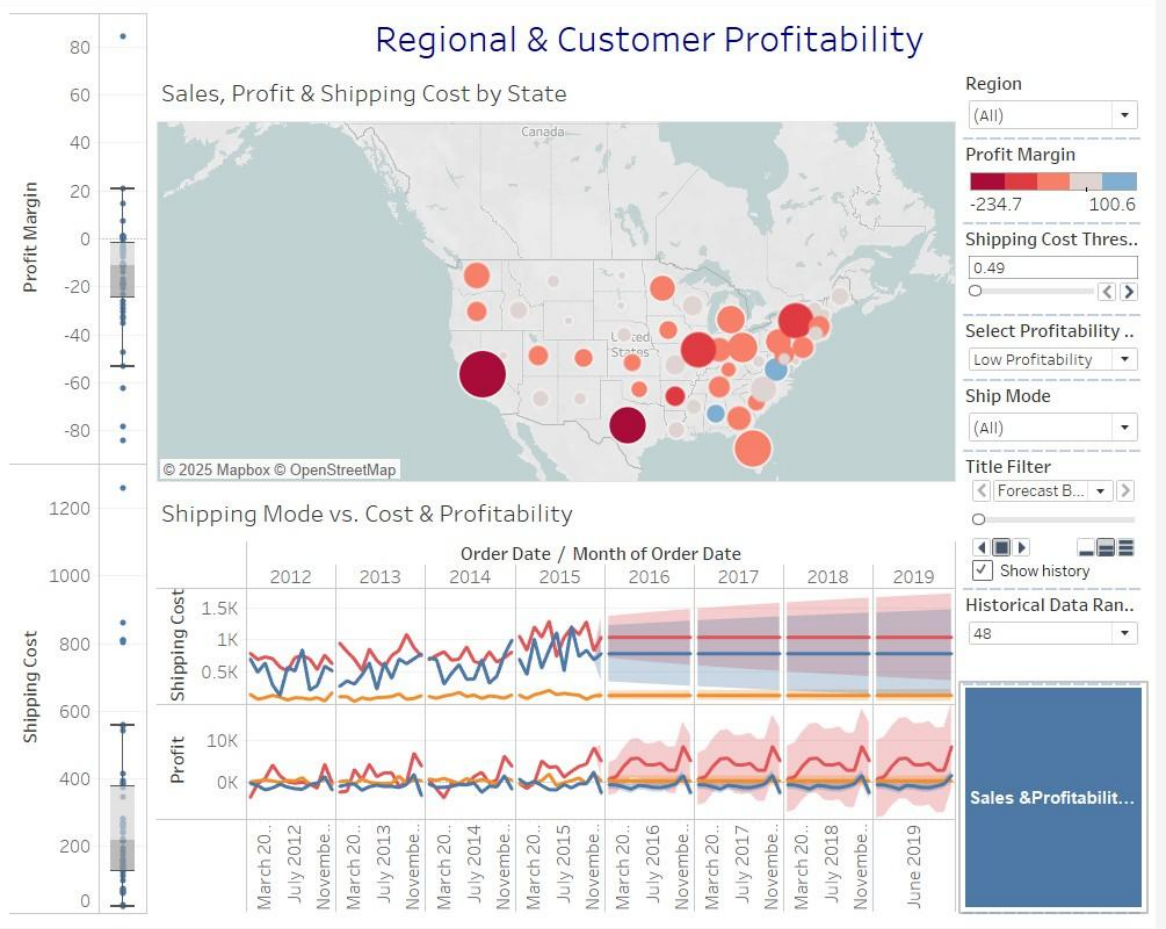
Filter Action: Allows users to filter by product category and sub-category to drill down into specific data.
Highlight Action: Enables quick identification of selected product categories.
Go-to-URL Action: Provides an external link to *https://en.wikipedia.org/wiki/Pareto_chart* to explain the Pareto principle, which is central to understanding the sales distribution.

Regional & Customer Profitability Dashboard

Goal: This dashboard focuses on regional shipping costs and their impact on profitability. It helps identify areas where high shipping costs negatively impact profit margins.

Key Visualizations:

Map Visualization: Displays regions with high shipping costs and low profitability.
Line Chart with Forecasting: Analyzes historical and projected shipping costs and profitability.
Box Plot: Examines profit margin distribution by state, filtering for low-profit regions.



Actions Used

Filter Action: Allows users to filter by region, profitability tier, and product sub-category.
Highlight Action: Helps focus on selected shipping modes or profit tiers.
Go-to-URL Action: Links to *https://www.tableau.com/blog/guide-to-mapping-in-tableau* to provide further context on geographic analysis in Tableau.

Performance Optimization Strategies

Steps Taken to Improve Performance:

Aggregating Data: The data was aggregated at the month level to reduce computation time for forecasting.
Parameter Optimization: The Forecast Length parameter was set to fixed intervals (24, 36, 48 months) to control the data range efficiently.
Minimizing Filters: Filters were optimized by using parameter controls instead of dynamic calculations whenever possible.

Performance Recorder Analysis

Key Findings from Performance Recording:

Rendering: The rendering time for visualizations was optimized to less than 0.12 seconds per event.
Computing Totals: This process took the most time, which was expected due to calculations related to running sums in the Pareto Chart.
Filtering Performance: Computing filters for the map and line chart was one of the most time-consuming operations, averaging around 16 events per interaction.
Query Execution: The most expensive operation was run_query, which executed 9 times, indicating that filtering actions were efficient but still required optimization.

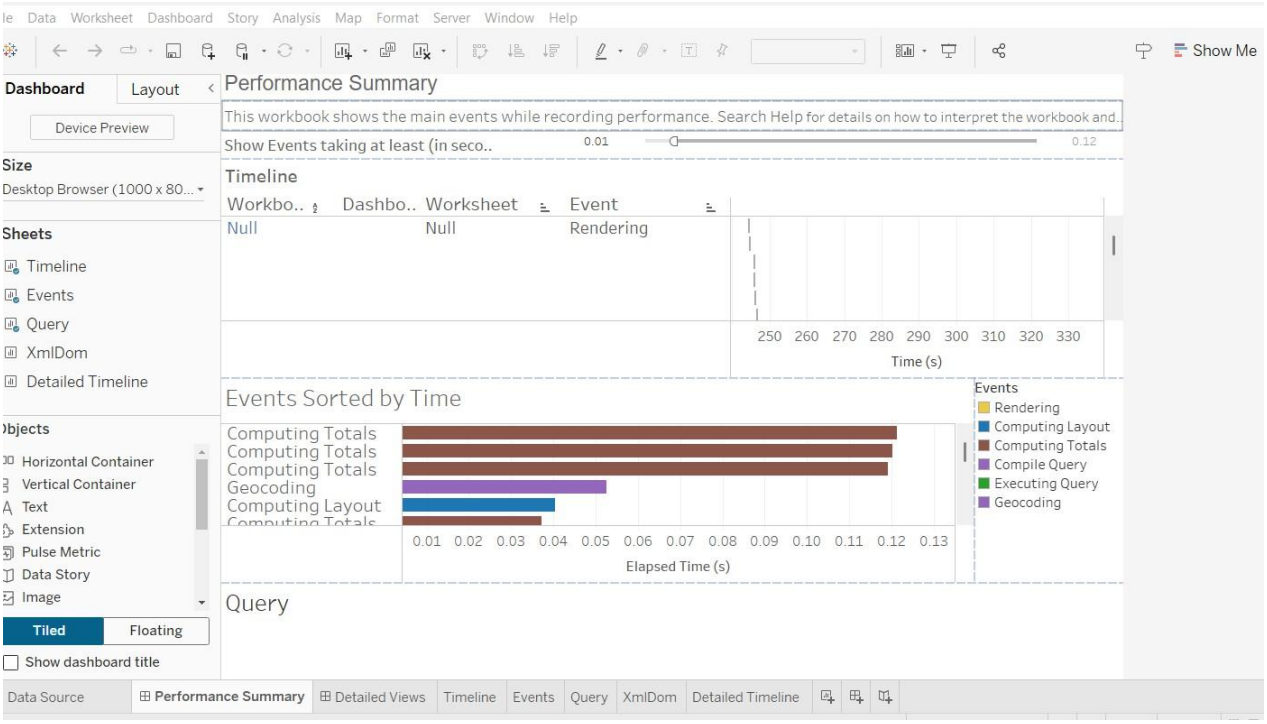

Performance Summary
This workbook shows the main events while recording performance. Search Help for details on how to interpret the workbook and..
Show Events taking at least (in seco..
Timeline
Workbo..
Dashbo..
Worksheet
Event
Null
Null
Rendering
Time (s)
Events Sorted by Time
Computing Totals
Computing Totals
Computing Totals
Geocoding
Computing Layout
Elapsed Time (s)
Events
Rendering
Computing Layout
Computing Totals
Compile Query
Executing Query
Geocoding
Query
Dashboard
Layout
Device Preview
Size
Sheets
Timeline
Events
Query
XmlDom
Detailed Timeline
Objects
Horizontal Container
Vertical Container
Text
Extension
Pulse Metric
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Image
Tiled
Floating
Show dashboard title
Data Source
Performance Summary
Detailed Views
Timeline
Events
Query
XmlDom
Detailed Timeline

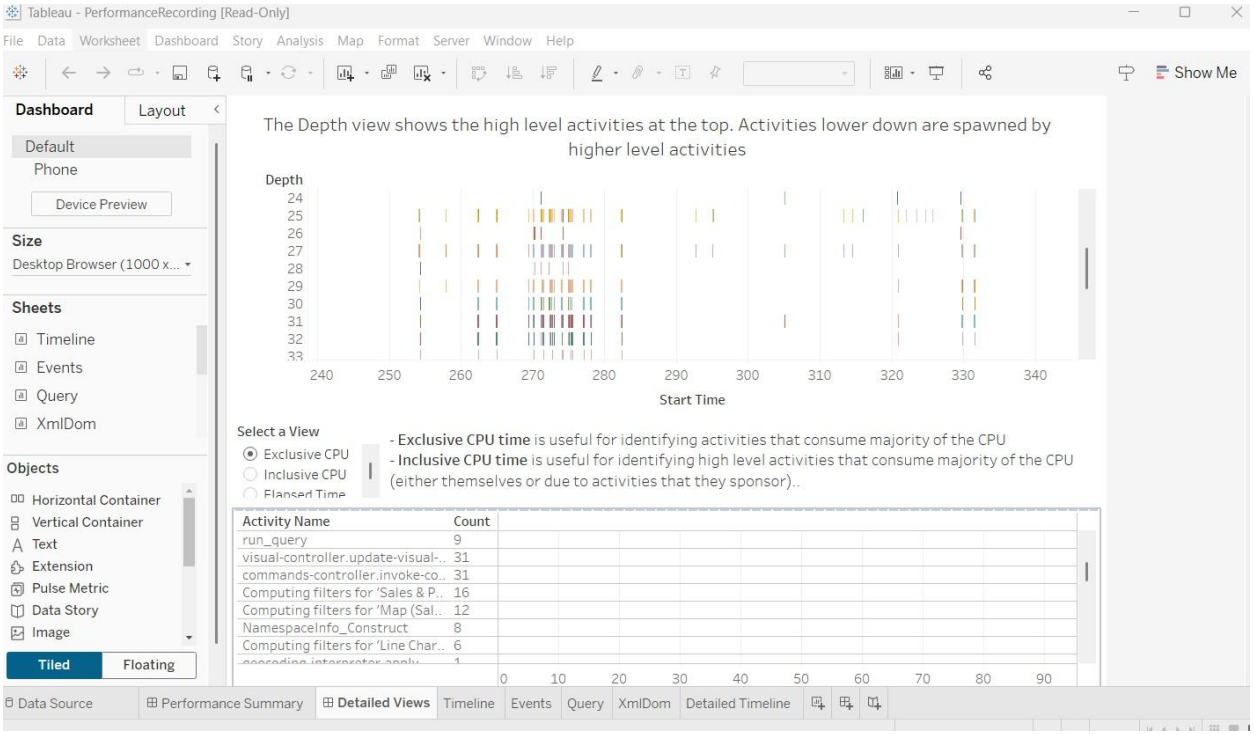
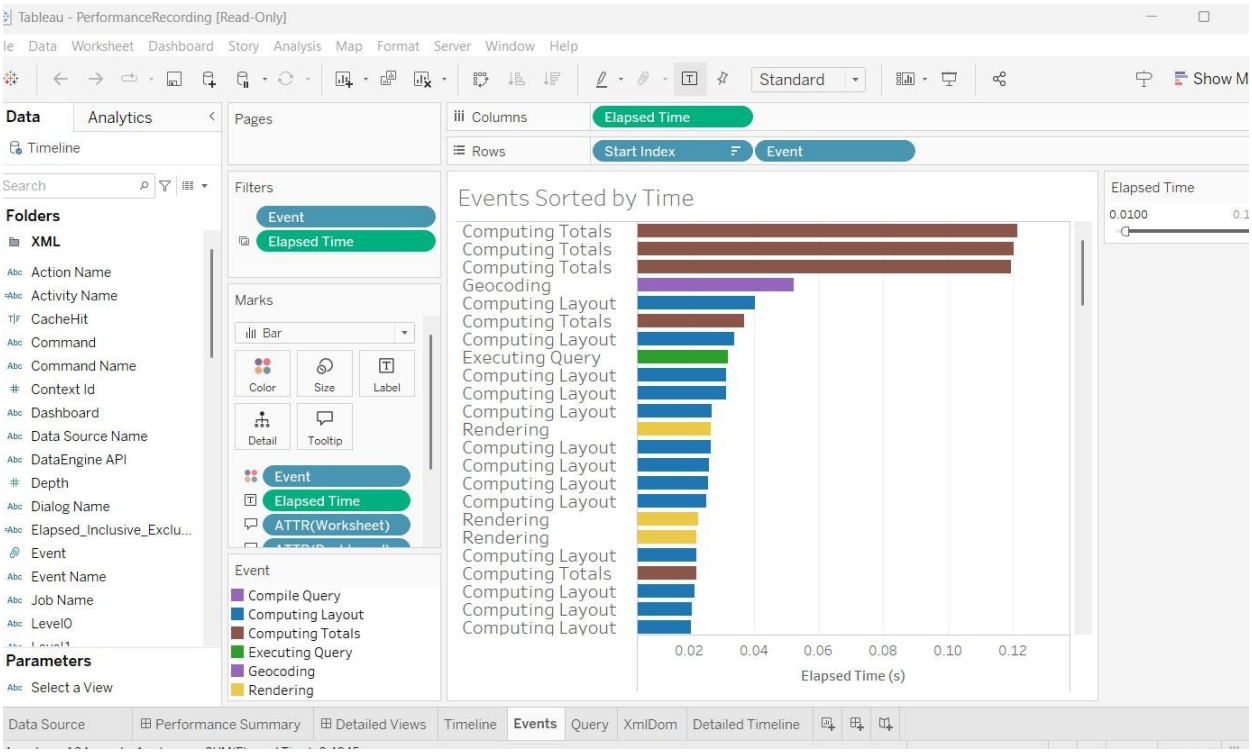


Tableau - PerformanceRecording [Read-Only]
The Depth view shows the high level activities at the top. Activities lower down are spawned by higher level activities
Depth
Start Time
Select a View
Exclusive CPU
Inclusive CPU
- Exclusive CPU time is useful for identifying activities that consume majority of the CPU
- Inclusive CPU time is useful for identifying high level activities that consume majority of the CPU (either themselves or due to activities that they sponsor)..
Activity Name
Count
run_query
visual-controller.update-visual-..
commands-controller.invoke-co..
Computing filters for 'Sales & P..
Computing filters for 'Map (Sal..
NamespaceInfo_Construct
Computing filters for 'Line Char..
Dashboard
Layout
Default
Phone
Device Preview
Size
Sheets
Timeline
Events
Query
XmlDom
Objects
Horizontal Container
Vertical Container
Text
Extension
Pulse Metric
Data Story
Image
Tiled
Floating
Data Source
Performance Summary
Detailed Views
Timeline
Events
Query
XmlDom
Detailed Timeline



Justification of Design Choices

Efficient Use of Space: Legends were moved to the top-right section to save dashboard space.
Cascading Layout: Dashboards were structured hierarchically, with broader insights at the top (Pareto Chart, Map) and more detailed trends below (Trend Line, Box Plot).
Ease of Navigation: Buttons were included to navigate between dashboards seamlessly.
Color Schemes: Different colors were assigned for highlighting critical insights, ensuring accessibility and ease of interpretation.

Roles of Story and Dashboard in the Visualization

Dashboard Role: Dashboards are interactive analytical tools that facilitate effective exploration of important business insights. By combining several visualizations into one view, they make it possible to compare several elements, like sales, discounts, profitability, and logistical expenses.

Interactivity & Insights: Users can interact with filters, parameters, and highlight actions to analyze specific product categories, sub-categories, or regions.

Data Consolidation: Dashboards integrate different chart types (Pareto charts, trend lines, scatter plots, maps) to present a holistic view of performance metrics.

Decision Support: By visualizing trends and relationships, dashboards help businesses determine whether discounting strategies, shipping costs, or product categories drive profitability.

Story Role: A Tableau Story provides a structured narrative that guides viewers through the data analysis process. Unlike dashboards, which offer an exploratory experience, stories emphasize **data-driven storytelling** by logically sequencing insights.

Guided Analysis: Stories organize dashboards into a progressive flow, starting from problem identification, data exploration, trend insights, and concluding with recommendations.

Highlighting Key Findings: Instead of overwhelming users with data, stories emphasize the most critical insights by structuring them in a step-by-step format.

Providing Business Context: By addressing key business questions (e.g., "Does a Higher Discount Lead to Higher Sales?"), the story ensures insights align with decision-making objectives.

How They Work Together?

The dashboard enables deep-dive analysis, while the story summarizes key takeaways for stakeholders, ensuring insights are communicated effectively and actionable conclusions are drawn. By using both dashboards and stories, organizations can bridge the gap between analysis and decision-making.